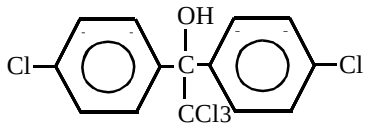
DICOFOL

CAS Registry Number: 115-32-2

Molecular Formula: $C_{14}H_9Cl_5O$



Dicofol occurs as crystals from petroleum ether. It is soluble in most aliphatic and aromatic solvents and insoluble in water (Merck, 1989).

Physical Properties of Dicofol

Synonyms: 4-chloro-a-(4-chlorophenyl)-a-(trichloromethyl)benzenemethanol; Acarin; 4,4'-dichloro-a-(trichloromethyl)benzylhydrol; DTMC; Kelthane; Mitigan; 1,1(bis(p-chlorophenyl)-2,2,2-trichloroethanol; di(p-chlorophenyl)trichloromethylcarbinol

Molecular Weight:	370.47
Boiling Point:	180 °C at 0.1 mm Hg
Melting Point:	77 - 78 °C
Density/Specific Gravity:	1.130 at 20/4 °C (water = 1)
Log Octanol/Water Partition Coefficient:	3.54
Water Solubility:	1.2 ppm at 24 °C
Conversion Factor:	1 ppm = 15.2 mg/m^3

(Howard, 1990; HSDB, 1993; Merck, 1983)

SOURCES AND EMISSIONS

A. Sources

Dicofol is registered as an acaricide. It is used for the control of mites in agricultural situations, and may be applied to a variety of fruit, vegetable, nut, and fiber (cotton) crops. It is used in nurseries and may also be applied to ornamental flowers, shrubs, trees, and lawns (DPR, 1996).

The licensing and regulation of pesticides for sale and use in California are the responsibility of the Department of Pesticide Regulation (DPR). Information presented in this fact sheet regarding the permitted pesticidal uses of dicofol has been collected from pesticide labels registered for use in California and from DPR's pesticide databases. This information reflects pesticide use and permitted uses in California as of October 15, 1996. For further information regarding the pesticidal uses of this compound, please contact the Pesticide Registration Branch of DPR (DPR,

1996).

B. Emissions

No emissions of dicofol from stationary sources in California were reported, based on data obtained from the Air Toxics "Hot Spots" Program (AB 2588) (ARB, 1997b).

C. Natural Occurrence

Dicofol is a synthetic chemical and it is not known to occur as a natural product (Howard, 1990).

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient measurements of dicofol.

The National Pesticide Monitoring Program reports the following ambient air results for dicofol. In 1970, 787 samples were taken from 14 states and dicofol was not detected. In 1971, 667 samples taken from 16 states showed 0.15 percent positive for dicofol, with an average concentration of 9.5 nanograms per cubic meter (ng/m^3). In 1972, 1,025 samples were taken from 16 states and dicofol was not detected (HSDB, 1991).

INDOOR SOURCES AND CONCENTRATIONS

Dicofol is used to control mites on houseplants. In a United States Environmental Protection Agency (U.S. EPA) non-occupational pesticide exposure study, 32 household pesticides were measured in homes in three cities over several seasons from 1986-1988 (Immerman and Schaum, 1990). The indoor concentrations of dicofol were very low. The mean indoor concentrations of dicofol for homes in Springfield/Chicopee, Massachusetts over two seasons were less than 0.05 micrograms per cubic meter. The mean indoor concentrations for homes in Jacksonville, Florida over three seasons ranged from below 0.05 ng/m^3 to 11.0 ng/m^3 (Immerman and Schaum, 1990).

ATMOSPHERIC PERSISTENCE

Based on the vapor pressure of 4×10^{-7} Torr at 25 ^oC (Worthing and Hance, 1991), dicofol is expected to partition between the gas and particle phases in the atmosphere, and is likely to exist largely in the particle phase. The average half-life and lifetime for particles in the atmosphere is estimated to be about 3.5-10 days and 5-15 days, respectively (Atkinson, 1995; Balkanski et al., 1993).

AB 2588 RISK ASSESSMENT INFORMATION

Dicofol emissions are not reported from stationary sources in California under the AB 2588 program. It is also not listed in the California Air Pollution Control Officers Association Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines as having health values (cancer or non-cancer) for use in risk assessments (CAPCOA, 1993).

HEALTH EFFECTS

Probable routes of human exposure to dicofol are inhalation, ingestion, and dermal contact.

Non-Cancer: Dicofol is a chlorinated hydrocarbon. Dermal absorption is facilitated by organic solvents. By analogy to other organochlorines, dicofol may cause liver and kidney disease and central nervous system effects including twitching, dizziness and convulsions. Repeated dermal exposure to experimental animals has resulted in death (Clayton and Clayton, 1981). In combination with trichlorfon (an organophosphate), dermal exposure has led to allergic dermatitis (IARC, 1983). Dicofol interferes with preimplantation and is teratogenic in mice (Reprotox, 1995).

The U.S. EPA has not established a Reference Concentration (RfC) or an oral Reference Dose (RfD) for dicofol (U.S. EPA, 1995a).

Cancer: Dicofol, administered orally, causes liver carcinomas in male mice but not in male or female rats. Human data are not available. Mutagenicity has not been observed in 2 bacterial systems (metabolic activation not specified) (HSDB, 1995). A cancer risk assessment is under review by the U.S. EPA (U.S. EPA, 1995a). The International Agency for Research on Cancer has classified dicofol as Group 3: Not classifiable as to its carcinogenicity in humans, based on lack of data in humans and limited data in experimental animals (IARC, 1987a).